

## AN/SQQ-89A(V)15 Integrated Undersea Warfare (USW) Combat Systems Suite

### Executive Summary

- The Navy's Operational Test and Evaluation Force (OPTEVFOR) commenced FOT&E on the AN/SQQ-89A(V)15 Advanced Capability Build (ACB)-13 variant with the exception of the Continuous Active Sonar operational testing, which was canceled due to asset unavailability.
- OPTEVFOR completed combined operational cybersecurity testing on AN/SQQ-89A(V)15 ACB-11 and ACB-13. In 2QFY20, DOT&E submitted a classified cybersecurity update to its previous IOT&E report.
- DOT&E approved the Test and Evaluation Master Plan (TEMP) for the ACB-15 variant in October 2020.

### System

- The AN/SQQ-89A(V)15 is an integrated undersea warfare (USW) combat system that is deployed on *Ticonderoga*-class cruisers and *Arleigh Burke*-class destroyers. It is composed of the sensors, processors, displays, and weapon controls to detect, classify, localize, and engage threat submarines and alert on threat torpedoes. It is an open-architecture system that includes staggered biennial software upgrades (ACBs) and biennial hardware upgrades (Technical Insertions).
  - Acoustic sensors include a hull-mounted array, Multi-Function Towed Array (MFTA) TB-37 (including a towed acoustic intercept component), Noise Monitoring Hydrophones, helicopter, and/or ship-deployed sonobuoys.
  - Functional segments process and display active, passive, and environmental data.
- The AN/SQQ-89A(V)15 interfaces with the Aegis Combat System to prosecute threat submarines using MK 54 torpedoes from surface vessel torpedo tubes, Vertical Launch Anti-Submarine Rockets, or MH-60R helicopters.



HMA - Hull Mounted Array  
MFTA - Multi-Function Towed Array

### Mission

- Theater and Unit Commanders use surface combatants equipped with the AN/SQQ-89A(V)15 to locate, monitor, and engage threat submarines.
- Maritime Component Commanders employ surface combatants equipped with the AN/SQQ-89A(V)15 as escorts to high-value units to protect against threat submarines during transit. Commanders also use the system to conduct area clearance and defense, barrier operations, and anti-submarine warfare (ASW) support during amphibious assault.

### Major Contractor

Lockheed Martin Mission Systems and Training –  
Manassas, Virginia

### Activity

- In March 2020, DOT&E submitted a classified Cybersecurity Update Report to the December 2018 ACB-11 IOT&E report. That report details the cyber survivability of ACB-11 as well as the subsequent variant, ACB-13.
- In October 2020, DOT&E approved the AN/SQQ-89A(V)15 TEMP 802-2, Revision 8. Revision 8 includes an Annex that describes the testing strategy for ACB-15.
- In 4QFY20, asset unavailability resulted in a cancellation of ACB-13's Continuous Active Sonar operational test.

### Assessment

- The final assessment of AN/SQQ-89A(V)15 ACB-13 is not complete, as testing is expected to continue into FY21. DOT&E's assessment of this system remains largely unchanged from the IOT&E report for ACB-11.
- Cybersecurity results affecting ACB-11 and ACB-13's operational effectiveness are included in the classified March 2020 update.
- ACB-11 is untested against operationally relevant midget and coastal diesel submarine threats. The Navy has no

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representative surrogate for this type of submarine to use for test.

- Operational availability of MFTA is low, primarily due to extensive logistical delays associated with its repair. ACB-11 uses MFTA as a primary sensor for submarine search and torpedo defense. MFTA operational availability has demonstrated some improvement, likely due to Navy action to increase MFTA spare parts inventory.

2. Develop a representative surrogate for testing AN/SQQ-89(V)15 performance against midget and coastal diesel submarine threats.
3. Continue efforts to improve the operational availability of MFTAs.

## Recommendations

The Navy should:

1. Address the recommendations in the classified DOT&E IOT&E cybersecurity update for ACB-11 and ACB-13.